

**Table 3** Effect of botulinum toxin on drooling in children with cerebral palsy

Citation	Study group	Study type	Outcome	Results	Comments	Level of evidence
Jongerius <i>et al</i> (2001) <sup>1</sup>	3 children (11–13 years) CP and severe drooling	Case series. Treatment with single dose BTX-A into submandibular glands. Total dosage: 40 u if 15–25 kg 50 u if >25 kg	Saliva secretion Quality of life questionnaire	Maximal salivary flow rate of sublingual and submandibular glands reduced by 51–63%	16 week study period: 1 child did not drool, the 2nd had reduced drooling, the 3rd had decreased drooling initially but not sustained Conclusion: duration of effect variable	4
Jongerius <i>et al</i> (2004) <sup>2</sup>	45 children (3–18 years) CP and severe drooling	Controlled, open label, clinical trial. Treatment with scopolamine patches, then with BTX-A into submandibular glands. Total dosage: 30 u if <15 kg 40 u if 15–25 kg 50 u if >25 kg	Saliva secretion (measured by DQ drooling quotient, TDS teacher drooling scale and VAS visual analogue scale)	DQ: 53% responded to scopolamine and 64% responded to BTX-A at 2 weeks and 49% at 24 weeks TDS: 61.5% good responders 8 weeks post BTX-A and 36% at 24 weeks VAS: reduced drooling throughout study	71% patients experienced moderate–severe side effects with scopolamine With BTX-A only non-severe side effects	3B
Jongerius <i>et al</i> (2004) <sup>3</sup>	45 children (3–18 years) CP and severe drooling	Controlled, open label, clinical trial. Treatment with scopolamine patches, then with BTX-A into submandibular glands. Total dosage: 30 u if <15 kg 40 u if 15–25 kg 50 u if >25 kg	Salivary flow rate	Submandibular flow rate decreased 25% with scopolamine and 42% 2 weeks after BTX-A Significant reduction with BTX-A compared with scopolamine at 4 and 8 weeks but between 8 and 16 weeks significance disappeared	Although BTX-A resulted in a greater reduction to submandibular flow than scopolamine overall 95% responded to scopolamine with significantly lower response rates to BTX-A (varying from 69% at 2 weeks to 49% at 24 weeks)	3B
Bothwell <i>et al</i> (2002) <sup>4</sup>	9 children (4–17 years) severe drooling and moderate or severe retardation (6 had CP)	Case series. Single injection of BTX-A 10 u divided between parotid glands	Saliva secretion (measured using dental bibs and DQ) Caregiver rating scales	For saliva secretion 33% good responders, 22% moderate responders, 11% poor responders and 33% non-responders 55% of parents thought improvement at 4 weeks and 22% at 16 weeks	16 week study period. BTX-A not as successful compared with other therapies e.g. surgery, anticholinergic therapy	4
Suskind and Tilton (2002) <sup>5</sup>	22 subjects (8–21 years) CP and significant drooling	Prospective, open label, dose escalation study. 2 groups: Group 1 (12 subjects): injection of 10, 20 or 30 u in escalating doses into submandibular glands Group 2 (10 subjects) injection of 30 u into submandibular glands and 20, 30 or 40 u into the parotid glands	Saliva secretion (measured using dental roll weights, DQ) Quality of life questionnaire Evaluation of swallowing	Submandibular gland only 33% response Submandibular and parotid glands 80% response from caretaker evaluation No adverse effects on swallowing	Varying length of response Results difficult to interpret as recycling of patients within groups and no comment on optimum dosage within groups	4
Savarese <i>et al</i> (2004) <sup>6</sup>	21 patients (5–18 years) with CP and problematic drooling	Open label, non blinded, prospective study. 15 u BTX-A into each parotid gland	Saliva secretion (measured using VAS, number of bibs used/day, weight of dental rolls)	53% marked improvement in drooling, 21% moderate improvement, 15% slight improvement, 11% no response	79% parents said they would have their child undergo treatment again	4

## Should bubble baths be avoided in children with urinary tract infections?

**Report by**  
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**B**ubble baths are common products used by parents. Medical professionals, from students to consultants, can be heard across clinics throughout the country, advising

parents to avoid the use of bubble bath to help prevent another urinary tract infection in their child.

In our simple survey we could not find any labels on bubble baths intended for children or babies that reinforced this advice. Are we, as general paediatricians, providing unsubstantiated advice to our patients and parents?

### Structured clinical question

In a child [patient] does the avoidance of bubble bath [intervention] help to prevent urinary tract infections [outcome]?

### Search strategy and outcome

Secondary sources: Cochrane, Clinical Evidence—none.

Primary sources: Medline 1965 to present (urinary tract infection) AND (bubble bath) OR (soap)—none; search of (bubble bath) OR (soap).

**Table 4** Bubble bath and urinary tract infections

Citation	Study group	Study type (level of evidence)	Outcome	Key results	Comments
Marshall (1965) <sup>5</sup>	Single case: 2½ year old boy	(level IV)	Effect of bubble bath on irritative symptoms of lower urinary tract	Avoidance of bubble bath led to symptom resolution. Reintroduction of bubble bath 1 week later led to symptom recurrence within 12 h	Anecdotal evidence. Author's son (case) compared to twin brother (control) as shared baths. Supported anecdotal evidence of 2 cases (no details). Author advises to ascertain history of product use
Simmons (1955) <sup>6</sup>	280 adult females with vulvovaginitis	Descriptive study (level V)	Relative incidence of aetiological factors in vulvovaginitis	41% cases attributed to detergent/soap (bubble bath and bath salt) use. Avoidance of products caused symptom improvement	Adult patients all attending a private clinic. ?confounding factors (did review <i>Candida albicans</i> , <i>Trichomonas vaginalis</i> , atrophy, and allergens). Did not look at urinary tract infections. Authors' conclusion: "to warn patients against use of soaps"
Bass (1968) <sup>7</sup>	16 children (4.5–10 y) details of only 4 cases given	(level V)	Effect of bubble bath on irritative symptoms of lower urinary tract	Resolution of symptoms with bubble bath avoidance and recurrence with reintroduction. One child had meatal stenosis – although exact aetiology unknown, bubble bath reported as "most likely agent responsible"	First study published with children; only 4 cases discussed. All children already diagnosed as having urethral/bladder irritation attributable to regular bubble bath use. ?biased data. Urine cultures negative—did not look at urinary tract infections. Advise to enquire about bubble bath use
Heller (1969) <sup>8</sup>	50 premenarcheal girls (12 days to 13.5 y), 21 controls	Age matched case-control study (level III)	Aetiological factors in vulvovaginitis in premenarcheal girls	Specific aetiology found in 2/3 patients. Toxic-allergic reaction to bubble bath found to be most common cause for vulvitis (8 girls, all with symptom resolution on discontinuing bubble bath)	7 of the 8 girls that used bubble bath were daughters of "medical or paramedical personnel". Results show majority of cases caused by infectious agents if vaginal discharge present
Roberts (1973) <sup>9</sup>	10 adult women cases, only 2 cases discussed	Case study (level V)	Acute or recurrent urethral bladder irritation precipitated by bubble bath	Cessation of bubble bath with "little or no change in therapy" led to symptom subsidence. "Majority" of patients remained "free of urinary tract symptoms" over observed time	Author coined term "bubble bath cystitis" in 1967. 7 patients had overt or chemical diabetes mellitus. Many assumptions stated: "the urethritis and cystitis caused by bubble bath irritants undoubtedly predisposes tissues to complications of a chronic manner". Also comments on possible role of bubbles in transferring bacteria. Several anecdotal comments about physicians children affected
Paradise (1982) <sup>10</sup>	54 premenarcheal girls (5 months to 12 y)	Age matched case-control prospective study (level III)	Aetiological factors in vulvovaginitis in premenarcheal girls with and without discharge	A specific diagnosis could be made for 59% of patients. Chemical irritants caused symptoms in only 2 girls (one used uncommon brand of bubble bath and other used home-made lye soap)	Unselected population. Results with regard to aetiology of vulvovaginitis in parallel to Heller study. In contrast to Heller, chemical irritants caused genital symptoms in only 2 girls. Did not look at urinary tract infection
West (1998) <sup>11</sup>	16 adults (25–47 y)	(level V)	To compare irritancy of 9 children's liquid bubble baths via skin patch tests (erythema, scaling, and fissuring)	Bubble baths vary in ability to cause irritation. The higher number of surfactants in a product influences its irritancy potential	Study used higher concentration of 5% to elicit enough of a response to ensure valid comparison (the recommended concentration is 1% in solution). Thus using the modified patch test greatly amplifies the irritant response that would be expected with brief intermittent exposure in a normal bath

Embase: same search strategy—no additional papers.

Search results: no papers for combined search; 28 articles for (bubble bath) search, 4 relevant. Manual searching led to 3 further relevant papers.

See table 4.

### Commentary

Generations of general paediatricians have advised parents to avoid the use of bubble bath in order to prevent urinary tract infections. Indeed this advice is echoed by websites that parents may access for further information, such as BUPA<sup>1</sup> and the National Kidney Foundation.<sup>2</sup>

Our search revealed little evidence to support the avoidance of bubble baths to prevent urinary tract infections. Studies found showed that bubble bath is indeed an irritant to the urinary tract of children. Different brands of children's bubble bath lead to variable irritancy potential.

A United States Food & Drug Administration (FDA) three year cumulative adverse reaction rate for bath products indicated that the reaction rate for all bath products was between 1 and 3 per million units sold.<sup>3</sup> However, this is a reported rate and is likely to be higher if families were surveyed. Vaginal irritation from surfactant exposure in baths was a concern of the FDA at one point and led to the

warning on all foaming bath products (especially bubble baths for children).<sup>4</sup> This warning reads:

“Caution: use only as directed. Excessive use or prolonged exposure may cause irritation to skin and urinary tract. Discontinue use if rash, redness or itching occurs. Consult your physician if irritation persists. Use under adult supervision.”

There were no studies found looking at the effectiveness of avoiding bubble bath in the prevention of urinary tract infection. However it is still plausible that irritation may

increase the frequency of urinary tract infections. Should we then avoid bubble baths completely? Generally, parents and children enjoy the feeling and fragrance of bubbles in their baths. Also, the ease of use, attractive packaging, and formulations can aid in training children to bathe regularly.

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## CLINICAL BOTTOM LINE

- A common sense approach is advised in the lack of conclusive evidence.
- The avoidance of bubble bath may help to prevent conditions with presentations similar to lower urinary tract infections (e.g. vulval irritation) rather than urinary tract infections themselves. There is a paucity of evidence with regard to the effects of bubble bath on recurrent urinary tract infections. (Grade D)
- We believe that the enjoyment of bubble baths outweighs the limited evidence of their proposed harm. (Grade D)